

• The Inevitable Forest Finance Response: Investor Opportunities



Investor note

October 2020



INEVITABLE
POLICY
RESPONSE

:vivideconomics
putting economics to good use

What is the Inevitable Policy Response?

Action to tackle climate change has so far been highly insufficient to achieve the commitments made under the Paris Agreement, and the market's default assumption appears to be that no further climate-related policies are coming in the near-term. Yet as the realities of climate change become increasingly apparent, it is inevitable that governments will be forced to act more decisively than they have so far, and the market transition will accelerate.

The question for investors now is not if this structural shift will occur, but when it will occur, what policy and market developments will drive it, and where the financial impact will be felt.

In anticipation, Principles for Responsible Investing (PRI) commissioned Vivid Economics and Energy Transition Advisors to assess the nature of the IPR and to build a Forecast Policy Scenario (FPS) which lays out the policies that are likely to be implemented up to 2050 and quantifies the impact of this response on the real economy and financial markets.

The Inevitable Policy Response forecasts a response by 2025 that will be forceful, abrupt, and disorderly because of the delay, and the FPS shows that this response presents critical risks and opportunities for investors to take into account in their decision making. Detailed modelling results are all available on the PRI website:

- On the macroeconomy;
- On key sectors, regions, and asset classes;
- On the world's most valuable companies.

Investors need to act now to protect and enhance value by assessing the implications of the IPR Forecast for portfolio risk. The greater the delay in responding, the greater the potential cost.

This work explores the IPR Forecast's implications for risks and opportunities in the forest sector. It complements and builds upon PRI's existing [investor tools for understanding and managing risks in forestry and land use](#).

Executive Summary

Climate policy will inevitably reverse historic losses in forest cover given the affordability and broader attractiveness of land-based emissions reductions. Net-zero target announcements will accelerate over the coming five years. These policies will rely heavily on ending deforestation and shifting to forest restoration as one of the world's only massively scalable options for negative emissions. The Inevitable Policy Response (IPR), which models these expected policy developments in a Forecast Policy Scenario (FPS), results in a cessation of net forest cover loss by 2030, and a total of 350 Mha of afforestation and reforestation globally by 2050 (PRI, 2019).

Such policies involve large scale development projects that sequester carbon by expanding and restoring carbon-dense natural ecosystems including forests, collectively known as Nature Based Solutions (NBS). Delivering NBS at scale will involve historic mobilization of capital alongside a massive increase in NBS project development capacity around the world, but especially in tropical ecosystems where forest loss has been most prevalent.

The total NBS market value potential is estimated to be US\$ trillions, when measured as the net present value of discounted profits generated between now and 2070. This opens up enormous new opportunities for both project developers and investors. Forest-related Nature-Based Solutions (NBS) could generate US\$800 billion in annual revenues by 2050, worth US\$1.2 trillion today in NPV terms,¹ surpassing the current market capitalisation of the oil & gas majors.² Natural forest restoration, as a low-cost mitigation strategy with a more direct compensation model, is expected to be taken up first and generates most of the early benefits. Avoided deforestation could represent an additional large scale investor opportunity, but is further away from at-scale commercialisation since relevant low-emissions agriculture projects require more complex compensation mechanisms. Both could form part of green bond offerings of interest to the private sector as companies and countries seek ways to raise funds for mitigation projects.

Forest finance, historically dominated by public sector support, will increasingly be delivered by the private sector. Recent innovations in green finance make private sector participation in the forest sector possible, while the sheer scale of forest recovery required make that participation necessary. Moreover, by the end of the decade, the fuller and wider incorporation of land-based carbon sequestration in carbon offset markets will provide a more reliable long-term market structure for private actors.

Investors seeking to position themselves to capitalise on this opportunity must act now. By cultivating and originating early NBS opportunities that are already becoming mainstream, and by engaging policy makers on optimal enabling regulations, forward-looking investors can drive this market and its impact. Doing so will also help investors get exposure to the upside opportunities associated with net-zero transitions.

¹ Estimates are in 2019 US\$ terms. See Box 1 for further detail.

² As of June 2020. Oil & gas majors include BP, Chevron, China National Offshore Oil, ConocoPhillips, Enterprise Product Partners, EOG Resources, ExxonMobil, Kinder Morgan, Occidental Petroleum, Petrobras, PetroChina Company, Santos, Schlumberger, Sinopec, Suncor Energy, and Total.

Climate action will drive large-scale forestry

Unsustainable destruction and degradation of forest land has been a primary contributor to the current climate crisis. Since humans first began cutting down forests, roughly half of global forest cover has been lost (Crowther, Glick, and Covey, 2015). Much of that taken place relatively recently, with about one-fifth of the Amazon rainforest destroyed in the last 50 years. Agriculture accounts for the vast majority of deforestation, with mining and infrastructure serving as additional drivers and facilitators of deforestation (Curtis et al., 2018) (Kissinger, 2012). Timber, fuelwood and wildfires account for most of the rest, and for most forest degradation. This loss translates into massive greenhouse gas (GHG) emissions; if tropical deforestation were a country, it would represent the third largest emitter of greenhouse gases annually (Gibbs, Harris, and Seymour, 2018). Beyond emissions, the loss of forest cover jeopardizes the wide variety of other ecosystem services that forests provide, including being an important part of biodiversity provision, local precipitation cycles, temperature regulation, air quality, soil erosion control, and water storage (IPCC, 2019).

Forestry policy has been an early testing ground of climate commitments and is expected to scale up rapidly given its efficacy and high benefit cost ratio. Historic forest loss has made it a focus of climate action. Government policies supporting nationally determined contributions (NDCs) set by the Paris Climate Accords have adopted a variety of approaches to reducing net forestry emissions. Tropical developing countries have long been ramping up their efforts to curb deforestation, and many countries are mobilising for reforestation and afforestation targets that contribute negative emissions to national GHG accounts. Policy instruments to achieve these aims are proliferating, including zoning enforcement, stopping illegal deforestation, and domestic carbon markets that incentivise increased forest cover. International carbon pricing policy, delivered through international agreements, linked emissions trading schemes and voluntary markets, is beginning to support this domestic action. These efforts have achieved some success in slowing forest losses in particular locations, but further action is required to stop and reverse the dramatic loss of forest cover.

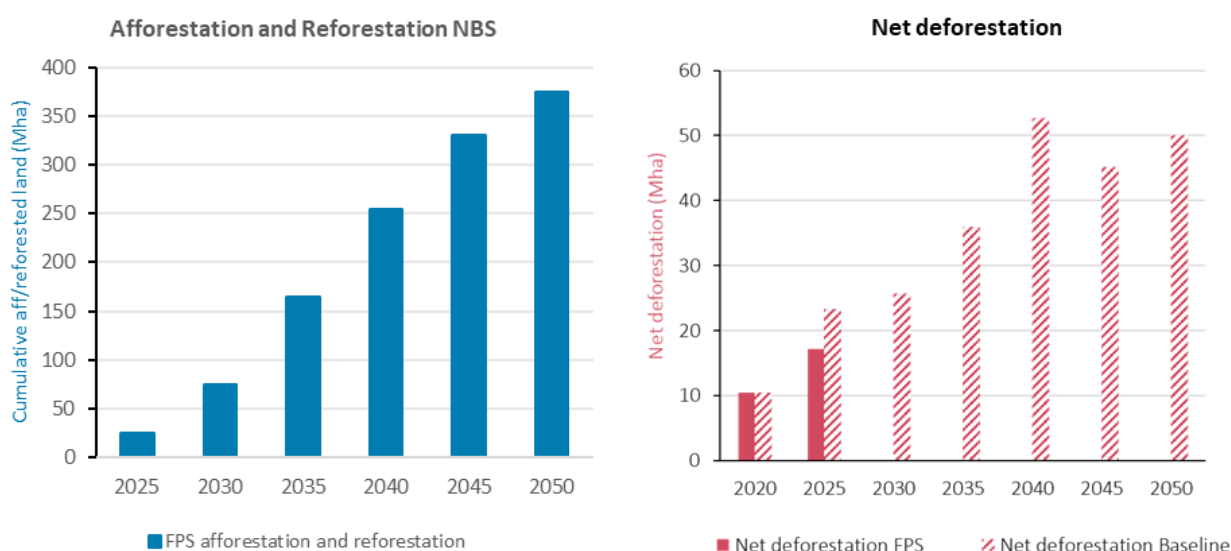
An inevitable policy response to climate change will increase the breadth and ambition of forest policy, with enormous growth potential for Nature-Based Solutions (NBS). The ‘ratchet mechanism’ built into the Paris Agreement, a series of international climate coordination commitments beginning in 2023, is expected to kick off an acceleration of policy announcements. Lawmakers will have to respond to growing awareness of climate issues and public demand for further action. The forestry sector, as the predominant delivery mechanism for NBS, has attracted a dominant share of public attention, and is expected to feature prominently in near-term announcements. Initial action is likely to increase the ambition of domestic policy, including through the expansion of protected areas, restoration of degraded lands, tree planting efforts and increased investment in improving agricultural productivity in order to limit expansion into forested areas. Improved incentive mechanisms are expected later in the decade to support domestic ambitions. These national and bilateral payment systems will include payment for ecosystem services schemes, expanded REDD+-style programmes and increasingly integrated international offset markets and emissions trade.

Emerging policies suggest that land sector carbon policy is already accelerating. Sixty carbon pricing initiatives are implemented or scheduled around the world, covering 21% of global emissions in 2020 (World Bank, 2020). These policies increasingly include the forest sector. Early-adopter jurisdictions including New Zealand, California, Spain, and a number of Canadian provinces all have provisions for crediting NBS, and the first offset projects are now providing their developers with steady streams of carbon credits (Michaelowa et al., 2019). With pilot-scale projects starting to pay-off, small private developers are increasingly getting involved with offset delivery; five of the nine projects issued credits on California’s offset market in 2019 were delivered by private companies, which have historically been undertaken by NGOs and charitable foundations. Developing countries are also increasingly turning to offset markets to support ambitious promises of reversed forest loss. The Colombian government included a mechanism for companies to offset carbon tax obligations under their recent Carbon Tax Law, which diverts a share of revenue to financing Herencia Colombia, a conservation and restoration program for 20 million hectares of natural ecosystems.

Calls for net-zero plans will support burgeoning demand for negative emissions from NBS. While offsets are not a replacement for emissions reductions, they form an important part of emerging net-zero strategies for many industries. If the most emissions intensive industries, including cement, steel, heavy transport and plastics are to reach net-zero targets before 2050, offsets will likely be required (Ach et al., 2018). The flurry of recent company net-zero target announcements, across the oil & gas, utilities, steel, cement, consumer goods, mining and aviation sectors, will fuel demand for NBS as the regulatory and verification frameworks come into place. BHP Billiton, for example, is providing a price-support mechanism for a \$152m forest bond issued jointly with IFC, and carbon credits it acquires through the mechanism may help offset future carbon liabilities (Klopfer & Panajyan, 2016). At a country scale, more international demand for verified carbon credits are coming through initiatives like REDD Early Movers, which includes donor countries like Norway, Germany, and the UK, and offers payment for verified emission reductions from deforestation prevention.

These policies will rapidly curb forest loss and support gradual recovery of total forest by 2030. The Inevitable Policy Response (IPR), modelled in a Forecast Policy Scenario (FPS), a high conviction forecast that incorporates the policy mechanisms discussed above, results in a cessation of net forest cover loss by 2030, and a total of 350 Mha of afforestation and reforestation globally by 2050, as illustrated in Figure 1 below (PRI, 2019).

Figure 1 Climate forestry efforts ramp up after the expected ‘Paris Ratchet’ policies beginning in 2025



Note: Forest land estimates include dense, high-carbon stock forest land only. Note that the IPR projects zero net deforestation after 2030.

Source: The Inevitable Policy Response Project (PRI, 2019)

A 1.5-degree climate target would require a more ambitious expansion of forest cover and drive even greater forestry-related NBS. The realistic but forceful IPR FPS fails to reach a 2 degree emissions target, but IPCC scenarios suggest that the more ambitious climate policy of a 1.5 degree target would require as much as 1,200 Mha of increased forest cover by 2100 (IPCC, 2018). At nearly 10% of global land area, this would expand current forested area by a third and restore it to near pre-industrial levels. Robust carbon pricing policy and offset markets are some of the most important drivers of long-term forest cover expansion because land-based carbon sequestration is a high-capacity source of inexpensive mitigation, with 50% of mitigation potential achievable at costs under 20 US\$/tCO₂e (Bellassen & Luysaert, 2014; Busch et al., 2019). As land-based mitigation pathways that rely heavily on bioenergy come under increasing scrutiny, NBS to expand forest cover make up an increasing share of negative emissions in 1.5 and 2 degree pathways (Reid et al., 2019).

Climate forestry is ready for at-scale financing

This large-scale climate forestry effort will involve massive increases in finance, ramped up rapidly across multiple regions. Afforestation and reforestation projects are characterised by high upfront investments in land purchasing, planting and remediation costs, with benefits accruing over long time horizons. The financial sector will play a major role in supporting the development and deployment of NBS, for instance in mobilising long-term capital seeking secure and stable returns, in providing products to hedge risk from uncertain future carbon prices, and in developing new financing models for small holders and in developing countries where NBS are economically attractive but capital is hard to raise. Delivery models may draw on the large-scale, land-based project expertise that has been developed by publicly traded firms across agriculture, forestry, oil and gas, and mining sectors. Regardless of how NBS projects are delivered, they will demand significant sources of finance and investment to scale.

Forest-based carbon stocks can generate US\$ trillions in net present value for investors through to 2050.

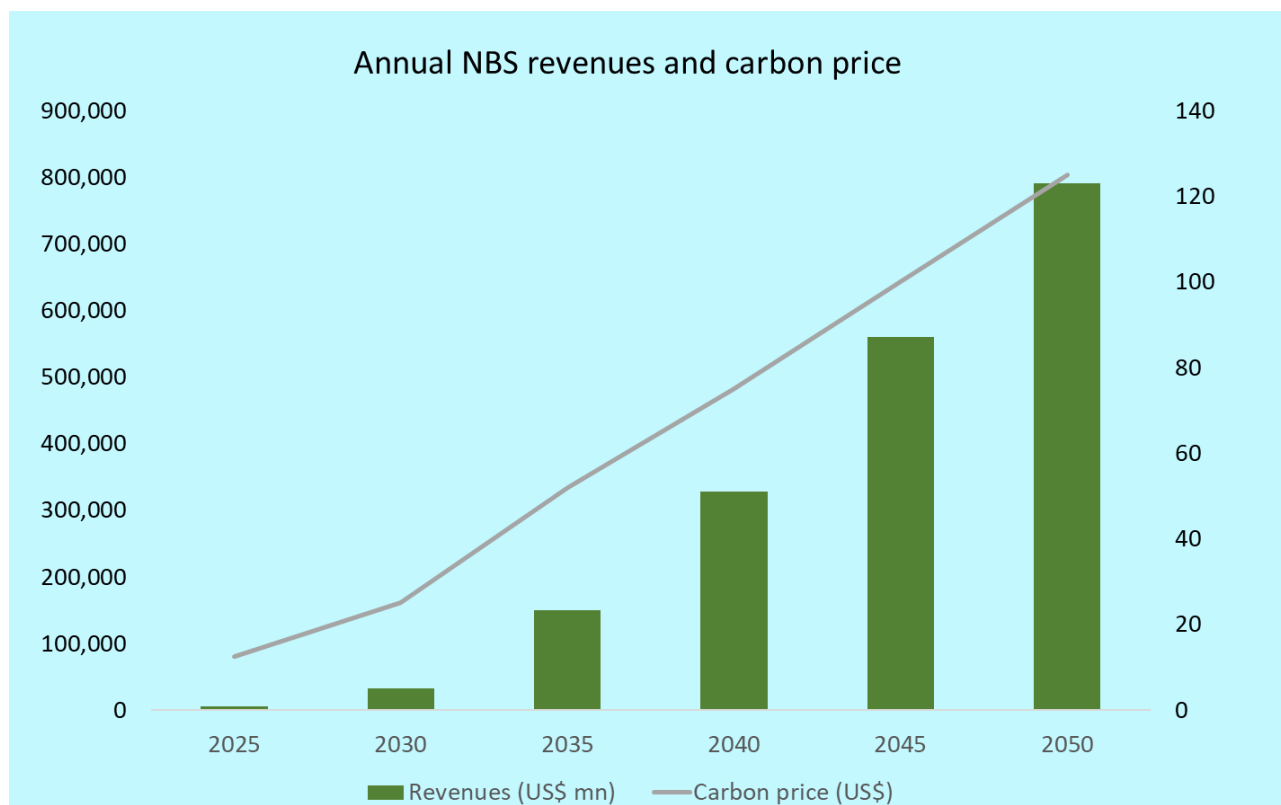
That is, land sector carbon policy will move towards valuing carbon stored in vegetation and soil, creating an entirely new industry driving economic growth and investment. This will unlock innovative land restoration, afforestation and avoided deforestation-based business models and investment opportunities.

Natural forest restoration, as a low-cost mitigation strategy, is expected to be taken up first and generates most of the early net present value. Forest-related NBS could generate US\$800 billion in annual revenues by 2050. From today's vantage point, emerging NBS investments are worth US\$1.2 trillion in NPV terms (see Box 1), surpassing the current market capitalisation of the oil & gas majors.³ These forest sector transformation and income-generating opportunities will require a massive scale-up of additional investment, whether in land acquisition or land management operations and supporting infrastructure. Natural forest restoration looks likely to emerge as a significant opportunity thanks to simple business models and pathway to commercialisation, since emissions reductions are more easily calculated, and accounting mechanisms have already been developed in some carbon markets.

Box 1 The size of the investor opportunity in NBS

To estimate the feasible size of the investor opportunity in NBS we created a very simple cash flow model to represent the global NBS market. First, we estimated the possible revenue growth of the market over time by using the IPR Forecast Policy Scenario's forward assessment of the number of hectares of reforestation globally, the amount of carbon sequestered, the possible carbon price they would secure, and small ancillary revenues from sustainable forest management. Revenues associated with NBS are driven strongly by the expected carbon price (see graph).

³ As of June 2020. Oil & gas majors include BP, Chevron, China National Offshore Oil, ConocoPhillips, Enterprise Product Partners, EOG Resources, ExxonMobil, Kinder Morgan, Occidental Petroleum, Petrobras, PetroChina Company, Santos, Schlumberger, Sinopec, Suncor Energy, and Total.



In order to generate estimates of returns (or cashflows), we also need to estimate costs – land, capital, and operational costs. These cashflows then need to be discounted to generate an estimate of the possible NPV of these investments (roughly equivalent to market capitalisation). These will vary significantly by location and need estimating on that basis – global high level averages would be misleading for any single project but can provide an indicative number for investors.

We used a 9% discount rate, which is consistent with discount rates used in the past for the valuation of forest projects,⁴ and estimated an indicative set of costs based on existing sources for reforestation projects.⁵ Based on this analysis, we estimate a possible NPV of NBS investments of US\$1.2 trillion, with an internal rate of return of 18%. These NPV calculations are very rough, and subject to a number of uncertainties, especially around the price of land, the actual price of carbon secured, and the appropriate discount rate given the possible risk levels associated with these investments in different markets. Nevertheless, they provide an early indication to investors of the possible scale of asset value represented by the NBS opportunity.

Avoided deforestation represents an additional opportunity whose value to investors could be enormous if emissions reductions versus business-as-usual activity are fully compensated. Projects that avoid deforestation are often further away from commercialisation since they involve more complex compensation mechanisms. Nevertheless, they represent a large potential value stream for low-emissions agricultural investments, and the carbon credit flows involved could form part of green bond offerings of interest to the private sector as countries seek ways to raise funds for mitigation projects.

NBS opportunities are geographically concentrated in regions with both dense carbon sinks and high existing rates of deforestation. These regions are home to many of the world’s tropical forests, peat bogs, coastal

⁴ See Bullard, S. H. and Straka (2011); and Ferguson (2018).

⁵ For example Summers, D., Bryan, B., Martin, N. and Hobbs (2015); and Zorrilla-Miras, P., Marcos, C., Mulligan, M., Giordano, R., Graveline, N., Máñez-Costa, M., Pengal, P., van der Keur, P., Altamirano, M., Matthews, J. and Lopez-Gunn (2018).

wetlands and mangrove swamps, which in the absence of carbon markets or other creative financing, are being cleared or developed on a large scale. In the global north, deforestation has largely halted and in many places, afforestation is already occurring but will be accelerated by the introduction of a carbon price. Carbon pricing, however, fundamentally changes land use decision-making in the global south, where land competition today continues to drive large-scale deforestation. In these countries low existing agricultural productivity means carbon-pricing combined with modest investments enable large gains in productivity, opening up large areas where forests can be reclaimed

In these countries, there are a number of key enabling policies expected to come into force over the course of the next 5-10 years. Key policy shifts will include:

- strengthening land tenure laws and resolving land title disputes, based on ongoing and extensive efforts to create forest and agricultural land registries
- addressing constraints on the bankability of local counterparties, built upon better land titles and an expanding system of improved access to rural credit
- ensuring effective governance and institutions, especially around the monitoring, reporting and verification to ensure carbon credits meet a high and tradable standard; and
- overcoming social and political barriers, especially ensuring that the transition creates better economic opportunities for rural and indigenous communities.

Under current NDCs, other studies have estimated that global carbon markets could mobilise annual trade of US\$185 billion by 2030 across energy and land-use and between US\$350 billion and US\$1.9 trillion by 2050 under 2 degree-consistent targets (Ecofys and Vivid Economics, 2016; IETA et al., 2019). The impact of the IPR is likely to be a significant increase in such carbon credit trade volumes for NBS, given a significant amount of international trading by and beyond 2030.

While some public finance may support this investment, there is a large financing gap that private finance will fill. Current global annual spending on development assistance is less than US\$150 billion annually (*Net ODA*, 2019) and concessional finance sums to about US\$580 billion per year (Buchner et al., 2015). This compares to the US\$1.6 trillion and US\$3.8 trillion per year required from 2016 to 2050 for supply-side energy system investments alone (Buchner et al., 2015). The net zero financing gap is large, and NBS opportunities (as with opportunities in energy, transport, etc.) will significant new private investment flows.

As local land-use policies tighten and carbon markets incorporate NBS, private sector actors will be increasingly able to finance forestry projects. Financing of forestry and land-based mitigation to date has largely involved public concessional finance (like REDD+) flowing from developed to developing countries. But forest finance markets have started to deepen and private sector engagement is expected to expand as market-based approaches proliferate. Carbon markets – such as emissions trading systems (ETS) – will unlock the revenue streams necessary to shift finance to new mechanisms for sustainable forest management practices more suitable for private investment, supercharging financing models that to date have had limited application in forestry (Bauch, 2017). For example:

- **Distressed asset**, where investors purchase and restore deforested or degraded public and private land to benefit from the carbon stock it produces, with the potential to sell the land on to other investors or to the government for conservation purposes. Restoration can be implemented by a land management company contracted by the investor.
- **Stewardship model**, where an investor leases deforested or degraded land without an ownership change, and the leaseholder receives the benefits flowing from the carbon stock associated with restorative management before returning it to the previous owner. Restoration can be implemented by a land management company contracted by the investor.
- **Carbon farming agreements**, where an investor supports the ‘farming’ of carbon through forest growth by providing the land manager with financing for the initial land purchase and planting costs. In return, the investor receives payments tied to the carbon stock increases. Such a model

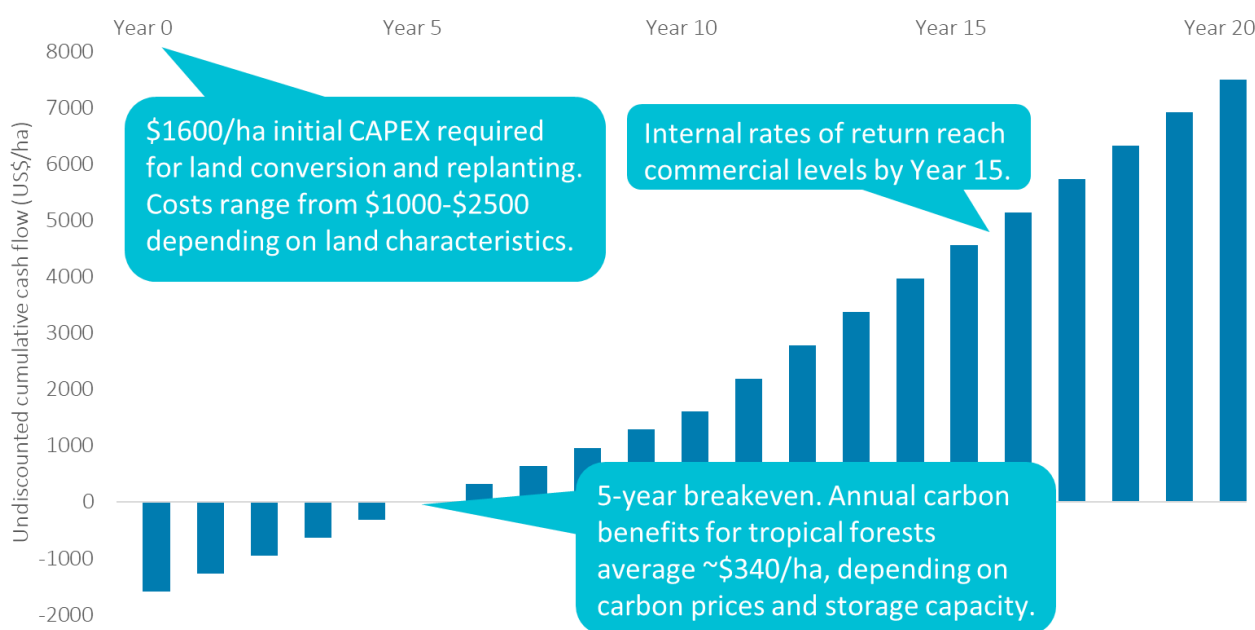
can be used to finance large land holders or cooperatives of smallholders, reducing the risk to those cooperatives while simultaneously reducing the administrative burden on investors.

- **Sustainable farming agreements**, where an investor supports traditional crop farming practices that reduce emissions or sequester carbon (e.g. in soils) by financing farmers’ land or capital cost. Investors receive payments when the carbon-reduction certificates are created and sold on the market. This too can be used to finance large farmers or cooperatives of small farmers.
- **Green bonds**, where investors can purchase securitised forest sequestration and carbon-reduction projects. This can allow investors to take stakes in projects already developed by others, and they can be used to aggregate projects that are of insufficient scale for investors, or that are developed by a government or NGO.
- **Forest insurance provision**, a disaster insurance against carbon losses from extreme weather, disease, or forest fires, which can improve carbon credit ratings and allow for risk sharing. This financing mechanism is currently provided predominantly through public funds, but presents an increasingly viable business for private insurers as the market grows.
- **Carbon off-taker guarantees**, financial instruments guarantee a future price for carbon credits, reducing carbon price volatility and risk for developers. Like insurance, they allow for risk sharing, and can be underwritten by public or private financial institutions.

Unlocking the opportunity associated with private sector forest finance will require investor innovation.

Figure 3 below shows an illustrative cash flow diagram for one of the most straightforward of the business models mentioned above. The cash flow is representative of a relatively mature finance market that does not currently exist for forestry. This market will only be available to firms that have developed expertise and an investment track record, experience that will require development over the coming decade in parallel with emerging climate policies. The value and location of early stage opportunities will depend on the idiosyncrasies of local policy development, but the early NBS market will offer firms a chance to experiment and position themselves strategically to deliver NBS to a more mature market.

Figure 2 Indicative cash flow for a hectare of pasture or cropland converted into forest



Note: These estimates are for owned land; Land purchase and resale values are not included. Afforestation opportunities must also balance biodiversity and local ecosystem services needs in order to be

sustainable. Afforestation only represents one approach to mobilising NBS while others may require alternative business models.

Source: (PRI, 2019)

Projects that avoid deforestation are expected to continue to receive public sector financing, but private investors will increasingly have access to related financing streams through offset markets and green bonds.

The financialisation of avoided deforestation involves incorporating credible REDD+ mitigation actions into investments by otherwise deforesting sectors (especially agriculture); which are used to generate certified carbon reduction credits, sold in off-set markets to generate revenue. However, establishing internationally acceptable rules – as part of Article 6 of the Paris Agreement – for the incorporation of such opportunities into global carbon markets is likely to take a number of years. Thus, the pace at which REDD+ credits become fungible in international carbon markets is likely to be slow. In the near term, this means such financing models will depend heavily on local policies, and that forest restoration opportunities are much closer to commercialisation than projects that avoid deforestation. For financial institutions, the eventual development of this market (first locally and then internationally) offers a number of opportunities, most prominently:

- **Sustainable farming agreements** could be used to support farming practices that reduce emissions and sequester carbon (e.g. in soils) where an investor finances land or capital costs for the land manager. Investors would then receive payments as the carbon reduction certificates are generated and sold. The investor may or may not also have a stake in the primary commodity being produced. Carbon market platforms, such as Nori in the US, are making on-farm soil sequestration increasingly investible.
- **Green bonds** that securitise sustainable farming projects that are either too small for investors or that are developed by a government or NGO. These can be issued and backed by governments, international organisations, development banks or private sector actors (Vivid Economics, 2017). They can also be issued prior to development or as a way of aggregating and reselling projects already developed. For example, the Responsible Commodities Facility provides low-interest credit lines to Brazilian producers who commit to planting on degraded pasture rather than clearing grassland or forest.
- **Carbon off-taker guarantees**, as described above, would set future prices for carbon credits, de-risking carbon price volatility for developers, and creating the opportunity for financial institutions to market-make and trade.

Investors of all sizes are already starting to explore these opportunities. Innovative investment models across these three opportunities are being pursued by impact investors, such as Pur Projet or Athelia, which have increasingly taken the mantle of innovative NBS finance from public Development Finance Institutions, a sign of increasing market maturity. Green Bonds in particular have developed into a mainstream commercial offering, rapidly growing from \$37 billion in 2014 to \$258 billion annually in 2019, but such markets still have much further to go (Fatin, 2020). Large institutional investors with long track records in emerging market debt have increasingly started dedicated green bond funds, including those at PIMCO, BNP Paribas, and HSBC. The Real Economy Green Investment Opportunity Fund, for example, channels investment exclusively to green bond issuances from non-financial corporates in emerging markets (Pulizzi, 2019). Specialist asset managers, such as NN Investment Partners, Ostrum Asset Management, Robeco, or Nikko Asset Management, are also closing large green bond funds. The Amundi Planet Emerging Green One Fund is one of the world's largest green bond funds, expected to deploy over 2 billion USD over its lifetime (Amundi Asset Management, 2018). Although green bonds with proceeds used for land-based emissions reductions remain small, the required standards and their application are well-established for their extension into this domain.

Investors can act now to unlock NBS value

By proactively engaging in policymaking and working with project developers and lenders to identify opportunities, investors can help create, and benefit from, a favourable investment environment. The development of robust offset and compliance markets for NBS mitigation provides the basis for investable opportunities, and as countries move toward net zero emissions targets these markets will become increasingly prominent. However, investors need to:

- **Move early** in the market to develop the novel business models, financing mechanisms, and expertise that positions them in a space expected to grow rapidly. In addition to developing an investment track record in the space, this helps investors hedge their exposure to markets that are carbon exposed. **As policies unfold and private financing mechanisms mature, investors can gain exposure to a large green upside.**
- **Support market and institutional development** by working with policy makers to ensure that the expanding NBS market is designed to work well for private financing. Support to the market as it develops will ultimately ensure that a greater share of future opportunities are accessible to private finance.

Investors can explore a number of channels for allocating capital to forest finance opportunities. The main channels of private sector finance are likely to be large agricultural and forestry companies (upstream or integrated), specialist funds that support NBS-focused project developers, and local agricultural and forestry lenders. In addition, large emitting sectors like oil, gas and mining are exploring large-scale project development, although investors will need to consider whether those vehicles enable them to gain exposure solely to the forest assets rather than being bundled with emissions intensive activities. Therefore, institutional investors can encourage well-positioned companies in their portfolios to invest strategically, they can seed and scale-up funding in specialist funds, they can work with banks to finance and securitise forest projects and sell these on to capital markets, and they can promote the use of green bonds to credibly channel large investment commitments into forest finance markets. Investors that seek early opportunities in the coming decade will find themselves well positioned to take advantage of more mature markets by 2030 and beyond.

Investors can support countries to enact efficient and credible markets conducive to investment. At the outset, this could include collaborating with governments to support new financing models through concessional finance, de-risking activities, and the provision of technical assistance while successful business models emerge. In the longer term, a robust price on carbon is the best way to deliver a sustained stream of NBS investment. To participate in global markets, and to enable the fullest participation of global investors, NBS mitigation must be credible, with policies establishing accurate baselines, addressing concerns regarding leakage and permanence, and avoiding the double-counting or double-claiming of mitigation outcomes. This requires well-functioning and cost-effective monitoring, reporting and verification systems, supported by effective governance and institutions. Investors' aim should be to ensure that countries adopt the right policy mix within a credible system of international rules.

Table 1 Barriers and policy solutions to the mobilisation of NBS investment

| Barriers to participation in NBS | Potential areas for policy engagement |
|--|---|
| <ul style="list-style-type: none"> • High hurdle rates for investment • Missing information and lack of capacity • Missing financial instruments • High credit risk and low risk-adjusted returns • High transaction and administrative costs | <ul style="list-style-type: none"> • Effective MRV governance and institutions • Safeguards for environmental integrity like buffers or government guarantees • Agricultural insurance products for smallholders • Support for new NBS financing models |

| Barriers to participation in NBS | Potential areas for policy engagement |
|---|--|
| <ul style="list-style-type: none"> Leakage and reversal risk | <ul style="list-style-type: none"> Market stability measures to maintain price incentives and reduce uncertainty Sticks and carrots to encourage global uptake |

Source: Vivid Economics

In addition, conscientious investors can help ensure the markets and policies for NBS incorporate considerations like the Just Transition and protection of biodiversity. Good performance on broad ESG criteria helps not only strengthen mitigation effort but also long-term sustainability and may accelerate the scale up of finance by addressing areas of stakeholder concern and possible opposition. Afforestation, reforestation and reduced deforestation will provide significant biodiversity benefits if implemented in a way that considers this source of value alongside pure carbon sequestration goals. Such considerations might affect both the terms of project development as well as the spatial targeting of investments to ensure restoration of biodiversity hotspots. In addition, land holders stand to gain substantially from the introduction of carbon markets, but well-structured policies and investments are required to ensure that small-holders and poor agricultural workers are able to enjoy the benefits of the transition. These markets will also encourage more productive production techniques and investments in irrigation development, the benefits of which would propagate throughout the economy. Yet these opportunities are not guaranteed, and it is only through active support for credible policies and development of NBS markets that investors will see these benefits come to fruition.

Interested investors can engage with PRI’s working group on sustainable land use. Deforestation, biodiversity and water, all closely interlinked with sustainable NBS provision, have been the focus of PRI’s Sustainable Land Use Initiative. PRI works with signatories involved with the group to engage investee companies and portfolios to fully understand the agriculture, forestry and land use risks posed by climate change. Starting with PRI’s tools for investors is an easy route to begin thinking about gaining exposure to green NBS opportunities, which actively seek to mitigate such risks.

References

- Ach, R. E., Ne, N. G., Emi, T. C., Harder-to, S. F., Sectors, A., & Mi, B. Y. (2018). *Mission Possible - report summary*.
- Amundi Asset Management. (2018). *IFC and Amundi successfully close world's largest green bond fund*. <https://www.amundi.lu/professional/Local-Content/News/IFC-and-Amundi-successfully-close-world-s-largest-green-bond-fund>
- Bauch, S. (2017). Incentives to save the forest. *Financial Instruments to Drive Sustainable Land Use*, 1–22.
- Bellassen, V., & Luysaert, S. (2014). Carbon sequestration: managing forests in uncertain times. *Nature*, 506(7487), 153–155. <https://doi.org/10.1038/506153a>
- Buchner, B. K., Trabacchi, C., Mazza, F., Abramskiehn, D., & Wang, D. (2015). *Global Landscape of Climate Finance 2015*.
- Busch, J., Engelmann, J., Cook-Patton, S. C., Griscom, B. W., Kroeger, T., Possingham, H., & Shyamsundar, P. (2019). Potential for low-cost carbon dioxide removal through tropical reforestation. *Nature Climate Change*, 9(6), 463–466. <https://doi.org/10.1038/s41558-019-0485-x>
- Crowther, Glick, Covey, et al. (2015). Mapping tree density at a global scale. *Nature*, 525, 201–205.
- Curtis, P. G., Slay, C. M., Harris, N. L., Tyukavina, A., & Hansen, M. C. (2018). Classifying drivers of global forest loss. *Science*, 361(6407), 1108–1111. <https://doi.org/10.1126/science.aau3445>
- D. Gibbs, N. Harris, F. S. (2018). *By the Numbers: The Value of Tropical Forests in the Climate Change Equation*. World Resources Institute. <https://www.wri.org/blog/2018/10/numbers-value-tropical-forests-climate-change-equation>
- Ecofys and Vivid Economics. (2016). *State and Trends of Carbon Pricing 2016*.
- Fatin, L. (2020). *Record 2019 GB Issuance*. Climate Bonds Initiative. <https://www.climatebonds.net/2020/01/record-2019-gb-issuance-255bn-eu-largest-market-us-china-france-lead-top-20-national>
- IETA, University of Maryland, & CPLC. (2019). *The Economic Potential of Article 6 of the Paris Agreement and Implementation Challenges*. September.
- IPCC. (2018). *Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways*.
- IPCC. (2019). *Climate Change and Land: an IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems* (D. C. R. P.R. Shukla, J. Skea, E. Calvo Buendia, V. Masson-Delmotte, H.- O. Pörtner, J. P. P. Zhai, R. Slade, S. Connors, R. van Diemen, M. Ferrat, E. Haughey, S. Luz, S. Neogi, M. Pathak, J. Petzold, & J. M. Pereira, P. Vyas, E. Huntley, K. Kissick, M. Belkacemi (Eds.)).
- Kissinger, G., M. Herold, V. De Sy. (2012) *Drivers of Deforestation and Forest Degradation: A Synthesis Report for REDD+ Policymakers*. Lexeme Consulting, Vancouver Canada.
- Klopper, A., & Panajyan, S. (2016). *IFC Issues Innovative \$152 Million Bond to Protect Forests and Deepen Carbon-Credit Markets*. International Finance Corporation.
- Michaelowa, A., Shishlov, I., Hoch, S., Bofill, P., & Espelage, A. (2019). *Overview and comparison of existing*

carbon crediting schemes. February. <https://doi.org/10.5167/uzh-175378>

Net ODA. (2019). OECD Data.

Pulizzi, J. (2019). *IFC, HSBC Create First Green Bond Fund Focused on “Real Economy” Issuers in Emerging Markets.*
<https://ifcextapps.ifc.org/IFCExt/Pressroom/IFCPressRoom.nsf/0/14FEF5C7A7CACFCF8525840F002CA127>

Reid, W. V, Ali, M. K., & Field, C. B. (2019). The Future of Bioenergy. *Global Change Biology, October 2019*, 274–286. <https://doi.org/10.1111/gcb.14883>

PRI. (2019). *The Inevitable Policy Response.* <https://www.PRI.org/inevitable-policy-response/forecast-policy-scenario-equity-markets-impacts/5191.article>

Vivid Economics. (2017). *The Potential Role of Enhanced Bond Structures in Forest Climate Finance. June.*
<https://doi.org/10.1596/28586>

World Bank. (2020). *Carbon Pricing Dashboard.* <https://carbonpricingdashboard.worldbank.org/>

World Bank Group. (2016). *World Development Indicators.*
<http://databank.worldbank.org/data/views/variableSelection/selectvariables.aspx?source=world-development-indicators#>

Company profile

Vivid Economics is a leading strategic economics consultancy with global reach. We strive to create lasting value for our clients, both in government and the private sector, and for society at large.

We are a premier consultant in the policy-commerce interface and resource- and environment-intensive sectors, where we advise on the most critical and complex policy and commercial questions facing clients around the world. The success we bring to our clients reflects a strong partnership culture, solid foundation of skills and analytical assets, and close cooperation with a large network of contacts across key organisations.

Contact us

Vivid Economics Limited
163 Eversholt Street
London NW1 1BU
United Kingdom

T: +44 (0)844 8000 254
enquiries@vivideconomics.com